

NEW JERSEY GROUND WATER MONITORING PROGRAM

(updated 12/05)

Background

As part of the EPA's ground water protection initiative, a network of monitoring wells was installed across central and southern New Jersey under the direction of the NJDEP/Pesticide Control Program (PCP). The wells are shallow (20-50 feet) and reach into subsurface aquifers. They are sampled annually to determine the presence of pesticides and direct the PCP to the problem chemicals and areas.

Thirteen wells were originally installed for the ground water monitoring network in 1997. By the end of 2004 that number had grown to 29. Twenty-six are located in the southern part of New Jersey and cover Burlington, Camden, Gloucester, Atlantic, Cumberland and Salem counties. Three are located in the mid-section of the state, covering Middlesex and Monmouth counties.

Sites for the network of wells were selected according to 1) pesticide use by municipality according to the PCP's agricultural pesticide use surveys, 2) the location of state-owned roads, and 3) visual inspection of proposed sites to determine suitability for drilling. The New Jersey Agricultural Pesticide Use Surveys, completed every three years by growers for the PCP, was the primary factor in deciding the location of the ground water monitoring wells.

Wells were installed on state property to avoid requesting permission from an outside owner resulting in a delay of the sampling schedule. Wells were installed on road shoulders to provide ample area for well installation and sampling procedures. All wells were installed and developed in cooperation with NJDEP/NJGS (New Jersey Geological Survey).

Field Sampling Procedures

All samples are collected by bailing. The DEP warehouse supplies decontaminated (and disposable) bailers and a clean bailer is used for each well. Each sampling event includes evacuating the equivalent of three well volumes by bailing, then pulling a one liter container of water and recording temperature, pH, standard conductivity and dissolved oxygen content. The sample is then drawn and clean 950-ml amber glass bottles are filled and capped. Bottles are certified cleaned for semi-volatile and pesticide/PCB analyses to EPA analyte specifications.

Samples are held in chilled coolers during transport and immediately placed in refrigerators upon arrival at the laboratory. All samples are kept at 4°C prior to extraction.

Each well in the network is sampled at least once a year. Some wells are sampled multiple times a year because of a history of detections or newness of construction.

Sample Results

Sampling started the November of 1997. By the end of 2005 a total of 364 samples had been taken.

Acetochlor, alachlor, atrazine, cyanazine, metolachlor and simazine, all EPA classified ground water leachers, are among the 75 parameters (pesticides) routinely analyzed for using a gas chromatograph/mass spectrometer. As of 2001, utilizing upgraded equipment, samples are also checked against a mass spectral library consisting of a larger list of 200+ non-targeted pesticides.

Water samples pulled from the PCP ground water monitoring well network are not considered drinking water samples. Nonetheless, detections are compared against the most stringent water criteria available. These criteria are listed below:

- EPA Drinking Water Standards – the listed Maximum Contaminant Level Goal (MCLG) and/or the Maximum Contaminant Level (MCL), whichever is lowest.
- EPA Health Advisories (HA) – the listed Life-time level. The Ten-day level for a 10-kg child is used if a Life-time level is not available.
- NJAC 7:9-6 Ground Water Quality Standards – the New Jersey Interim Generic Criteria for Synthetic Organic Chemicals (SOCs).

Wells displaying a compound exceeding guideline levels will be targeted for possible investigative projects if detected levels persist from year to year.

2005 Ground Water Monitoring Well Detections

29 wells sampled, 6 wells showed detections, 33 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard ($\geq 1\%$)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOCs
Bentazon*	H	1	3.91 ug/l	2%	3.91 ug/l	-	200 ug/l	-
Chlorthal-dimethyl*	H	4	766 ug/l	1094%	203 ug/l	-	70 ug/l	-
Metalaxyl	F	1	0.51 ug/l	-	0.51 ug/l	-	-	100 ug/l
Metolachlor	H	4	0.67 ug/l	-	0.41 ug/l	-	100 ug/l	-
Napropamide	H	1	0.25 ug/l	-	0.25 ug/l	-	-	100 ug/l
Norflurazon	H	1	0.40 ug/l	-	0.40 ug/l	-	-	100 ug/l
Simazine	H	3	0.57 ug/l	14%	0.46 ug/l	4 ug/l	4 ug/l	-

* first year of phenoxy-acid analysis

2004 Ground Water Monitoring Well Detections

29 wells sampled, 8 wells showed detections, 37 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard ($\geq 1\%$)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOCs
Atrazine	H	3	0.31 ug/l	10%	0.22 ug/l	3 ug/l	-	-
Bromacil	H	2	0.38 ug/l	-	0.33 ug/l	-	90 ug/l	-
D-atrazine	H	4	0.70 ug/l	-	0.40 ug/l	-	-	100 ug/l
Metalaxyl	F	2	0.45 ug/l	-	0.44 ug/l	-	-	100 ug/l
Metolachlor	H	8	1.70 ug/l	2%	0.57 ug/l	-	100 ug/l	-
Metribuzin	H	2	0.54 ug/l	-	0.42 ug/l	-	200 ug/l	-
Napropamide	H	1	0.31 ug/l	-	0.31 ug/l	-	-	100 ug/l
Simazine	H	4	0.40 ug/l	10%	0.35 ug/l	4 ug/l	4 ug/l	-

2003 Ground Water Monitoring Well Detections

29 wells sampled, 8 wells showed detections, 42 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard ($\geq 1\%$)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOCs
Atrazine	H	1	0.22 ug/l	7%	0.22 ug/l	3 ug/l	-	-
Bromacil	H	3	1.10 ug/l	1%	1.04 ug/l	-	90 ug/l	-
D-atrazine	H	1	0.33 ug/l	-	0.33 ug/l	-	-	100 ug/l
Metalaxyl	F	2	0.45 ug/l	-	0.42 ug/l	-	-	100 ug/l
Metolachlor	H	9	1.40 ug/l	1%	0.64 ug/l	-	100 ug/l	-
Metribuzin	H	1	0.61 ug/l	-	0.61 ug/l	-	200 ug/l	-
Napropamide	H	1	0.31 ug/l	-	0.31 ug/l	-	-	100 ug/l
Norflurazon	H	1	0.61 ug/l	-	0.61 ug/l	-	-	100 ug/l
Prometon	H	1	0.22 ug/l	-	0.22 ug/l	-	100 ug/l	-
Simazine	H	5	0.75 ug/l	19%	0.58 ug/l	4 ug/l	4 ug/l	-
Terbacil	H	2	0.47 ug/l	1%	0.42 ug/l	-	90 ug/l	-

2002 Ground Water Monitoring Well Detections

27 wells sampled, 9 wells showed detections, 45 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard (>=1%)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOC's
Alachlor	H	1	0.15 ug/l	8%	0.15 ug/l	2 ug/l	100 ug/l**	-
Atrazine	H	7	0.29 ug/l	10%	0.23 ug/l	3 ug/l	-	-
Bromacil	H	3	5.80 ug/l	6%	5.10 ug/l	-	90 ug/l	-
D-atrazine	H	1	0.64 ug/l	-	0.64 ug/l	-	-	100 ug/l
Metolachlor	F	3	0.61 ug/l	-	0.49 ug/l	-	-	100 ug/l
Metolachlor	H	16	6.10 ug/l	6%	1.08 ug/l	-	100 ug/l	-
Metribuzin	H	1	0.34 ug/l	-	0.34 ug/l	-	200 ug/l	-
Simazine	H	7	0.74 ug/l	19%	0.66 ug/l	4 ug/l	4 ug/l	-
Terbacil	H	1	0.30 ug/l	-	0.30 ug/l	-	90 ug/l	-

** Ten-day 10kg child

2001 Ground Water Monitoring Well Detections

22 wells sampled, 5 wells showed detections, 36 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard (>=1%)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOC's
Atrazine	H	1	0.15 ug/l	5%	0.15 ug/l	3 ug/l	-	-
Bromacil	H	3	0.72 ug/l	1%	0.67 ug/l	-	90 ug/l	-
D-atrazine	H	1	0.30 ug/l	-	0.30 ug/l	-	-	100 ug/l
Metolachlor	H	7	7.94 ug/l	8%	3.59 ug/l	-	100 ug/l	-
Norflurazon	H	1	0.28 ug/l	-	0.28 ug/l	-	-	100 ug/l
Simazine	H	5	1.50 ug/l	38%	0.78 ug/l	4 ug/l	4 ug/l	-

2000 Ground Water Monitoring Well Detections

21 wells sampled, 2 wells showed detections, 29 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard (>=1%)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOC's
Atrazine	H	2	0.32 ug/l	11%	0.25 ug/l	3 ug/l	-	-
Metolachlor	H	2	8.00 ug/l	8%	4.95 ug/l	-	100 ug/l	-
Simazine	H	2	1.40 ug/l	35%	0.73 ug/l	4 ug/l	4 ug/l	-

1999 Ground Water Monitoring Well Detections

21 wells sampled, 4 wells showed detections, 74 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard (>=1%)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOC's
Atrazine	H	2	0.16 ug/l	5%	0.09 ug/l	3 ug/l	-	-
Metolachlor	H	7	1.65 ug/l	2%	0.74 ug/l	-	100 ug/l	-
Simazine	H	3	0.68 ug/l	17%	0.48 ug/l	4 ug/l	4 ug/l	-

1998 Ground Water Monitoring Well Detections

13 wells sampled, 4 wells showed detections, 55 samples taken

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard (>=1%)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOC's
Acetochlor	H	1	0.31 ug/l	6%	0.31 ug/l	-	-	5 ug/l
Alachlor	H	1	0.05 ug/l	3%	0.05 ug/l	2 ug/l	100 ug/l**	-
Atrazine	H	3	0.03 ug/l	1%	0.01 ug/l	3 ug/l	-	-
Bromacil	H	1	1.40 ug/l	2%	1.40 ug/l	-	90 ug/l	-
Metolachlor	H	5	1.60 ug/l	2%	0.55 ug/l	-	100 ug/l	-
Simazine	H	5	1.80 ug/l	45%	0.91 ug/l	4 ug/l	4 ug/l	-

** Ten-day 10kg child

1997 Ground Water Monitoring Well Detections

13 wells sampled, 1 well showed detections, 13 samples taken***

Compound	Type	# of Detects	Highest Level Detected	% of Available Standard (>=1%)	Mean Level Detected	EPA DW Standard (MCL)	EPA HA (Life-time)	NJ Interim Generic GW Quality SOC's
Simazine	H	1	1.35 ug/l	34%	1.35 ug/l	4 ug/l	4 ug/l	-

*** Well monitoring started at the end of 1997 once the thirteen new wells were developed. Each well was sampled once.